

Dr. Bennett has traced the growth of mycodermatous vegetations in several cases of *Tinea*, and has given figures to show the appearances they present. He thinks that they spring up originally below, or in the thickness of the cuticle: they consist of small articulated filaments containing sporules. The author endeavoured to propagate the disease by introducing the sporules into his arm and scalp, but he did not succeed in causing the plants to germinate on parts different from those which originally produced them. A plant of a similar nature, consisting of jointed filaments and sporules, was detected by Dr. Bennett in the lungs of a man who died of tubercular consumption. The vegetations were seen on dissection, but were also detected in the sputa freshly expectorated during life. The plant is allied to *Penicillium glaucum*. A similar structure was seen in the sordes collected on the teeth and gums of persons labouring under typhus fever.

Dr. Bennett and Mr. Goodsir* have both examined the vegetations found occasionally growing on the gold-fish (*Cyprinus auratus*). These consist of elongated cells presenting the appearance of long jointed tubes, and of fine filaments arising from the sides of the cellular tubes. Numerous instances are mentioned in different tribes of animals, as mollusca, insects, fishes, birds, and mammalia, in which vegetations have been detected during life, and copious references are given to the works in which the cases are detailed. From all the facts which the author has been able to collect, he thinks it probable—"1st, that these vegetations always arise in living animals *previously* diseased; 2nd, that their presence indicates great depression of the vital powers, and impairment of the nutritive functions of the œconomy; 3rd, that the peculiar constitution or cachexia favourable to their growth is the tubercular or scrofulous in the mammalia, birds, and fishes, and most probably in reptiles and insects; and 4th, that the therapeutic indications are to invigorate the system, and to use locally, if possible, such applications as tend to destroy vegetable life."

The paper is one of great interest, and is worthy of an attentive perusal.

Further observations on the subject of the vegetable nature of *Tinea favosa* will be found in the 'Edinburgh Medical and Surgical Journal' for June 1842.

BIBLIOGRAPHICAL NOTICES.

A History of British Starfishes, and other Animals of the Class Echinodermata. By Edward Forbes, M.W.S., For. Sec. B.S., &c.

THIS book is one of that fair sisterhood of natural-history publications, for which we are indebted to Van Voorst. We had intended, immediately on the completion of the work, to have introduced it to

* See Annals, vol. ix. p. 333.

the notice of our readers, and have given them, as best we could, a knowledge of the kind of information which it contained, and of the manner in which that information had been communicated. But an editor, alas! like still greater potentates, is dependent on his allies, and not until now have we succeeded in obtaining that co-operation and assistance which the fulfilment of our design required. We shall therefore endeavour by a careful analysis, and by extracts more copious than we generally give, to make amends to our readers for our delay in making them acquainted with a work of such originality and value; one which has elicited the encomiums of Professor Agassiz, who, among living naturalists, is perhaps the one best qualified to appreciate its merits*.

The following passages from the introduction state precisely what portion of the animal kingdom is treated of under the term Echinodermata:—

“The Echinodermata constitute one of the three great classes into which the Radiata are divided. The Radiate type presents us with animals which either have their parts arranged in a ray-like manner round a common centre, or have their bilaterality so modified as to give them a star-like form. The Zoophytes, the Medusæ, and the creatures to which this volume is devoted, constitute the type. The Echinodermata are most highly organized, much more so than the Polytypes; they are almost all free animals, creeping about at the bottom of the sea; and as the greater number of species are covered with a coriaceous skin, which is commonly strengthened by calcareous plates or spines, they have derived their general appellation from that remarkable character, which at once distinguishes them from the Medusæ, free swimming animals of the most delicate and membranous texture.”

“The system most characteristic of the Radiate type is the Aquiferous, or apparatus for a water circulation; indeed, it can scarcely be said to exist in any of the other types. It is chiefly developed in the Arachnodermata and Echinodermata, and in the last is intimately connected with the movements of the animals; for it is by means of this water circulation that the suckers or cirrhi are enabled to act as organs of progression. In many species of the most typical group, that of *Echinidæ*, we find a portion of the dermatoskeleton turned in, as it were, to form arches for the protection of the water-canals, thus evidencing their great importance in those creatures. Among the Annelidous Echinodermata, however, the aquiferous system seems altogether to disappear.

“On the modifications of this characteristic system, its presence or absence, and its combination with the tegumentary system for purposes of motion, I have founded my arrangement of the Echinodermata. I look upon the Echinodermata and Arachnodermata as two parallel groups, and hold it as a law that *the divisions of parallel groups should be based on a common principle.*”

In accordance with this view the author proposes the following arrangement:—

Order I. PINNIGRADA. CRINOIDEÆ—First appearance of cirrhi, springing from brachial membranes, which, with the true arms, form the organs of motion.

* See Ann. Nat. Hist. vol. ix. p. 189.

- Order II. SPINIGRADA. OPHIURIDÆ—Disappearance of brachial membranes, cirrhi as before; true arms clothed with spines for motion.
- III. CIRRHIGRADA. ASTERIIDÆ—Arms disappear; body more or less lobed, and lobes channeled beneath for cirrhi, which act as suckers, and are the organs of motion.
- IV. CIRRHI-SPINIGRADA. ECHINIDÆ—Gradual disappearance of lobes; cirrhiferous canals appearing as avenues where cirrhi act as in Order III., but are assisted by mobile spines clothing the integument.
- V. CIRRHI-VERMIGRADA. HOLOTHURIADÆ—Lobes disappear; motions affected by avenues of cirrhi, assisted by contraction and extension of the soft body.
- VI. VERMIGRADA. SIPUNCULIDÆ—Cirrhi become obsolete and disappear; motion effected by the contraction and extension of the animal's body.

“All the Radiata,” it is remarked, “are greatly influenced in the arrangement of their parts by some definite number. In the Echinodermata the reigning number is five. The name of ‘five-fingers,’ commonly applied by mariners to the Starfishes, is founded on a popular recognition of the number regnant.”

“Every plate of the Sea-Urchin is built up of pentagonal particles. The skeletons of the digestive, the aquiferous, and the tegumentary systems, equally present the quinary arrangement; and even the cartilaginous framework of the disk of every sucker is regulated by this mystic number. When the parts of Echinoderms deviate from it, it is always either in consequence of the abortion of certain organs, or it is a *variation by representation*, that is to say, by the assumption of the regnant number of another class. Thus do monstrous Starfishes and Urchins often appear quadrate, and have their parts fourfold, assuming the reigning number of the Actinodermata, consistent with a law in which I put firm trust, that *when parallel groups vary numerically by representation they vary by interchange of their respective numbers.*”

We pass by the excellent tables showing the distribution of species, both in regard to the zones of the sea and the coasts of the British Isles, and proceed to the consideration of the several orders into which the Echinodermata are divided. The first is the *Crinoidea*, of which we have now but one living British species. The former abundance and present scarcity of these singular and interesting tribes is thus announced in the opening paragraph, in which the beauty of the diction is surpassed only by the elevation, the grandeur and poetic interest of the ideas which it embodies.

“One of the most remarkable phænomena displayed to us by the researches of the geologist, is the evidence of the existence, in primæval times, of animals and plants, the analogies of which are now rare or wanting on our lands and in our seas. Among those tribes which have become all but extinct, but which once presented numerous generic modifications of form and structure, the order of Crinoid Starfishes is most prominent. Now scarcely a dozen kinds of these beautiful animals live in the seas of our globe, and individuals of these kinds are comparatively rarely to be met with: formerly they were among the most numerous of the ocean's inhabitants,—so numerous that the remains of their skeletons constitute great tracts of the dry land as it now appears. For miles and miles we may walk over the stony

fragments of the *Crinoideæ*; fragments which were once built up in animated forms, encased in living flesh, and obeying the will of creatures among the loveliest of the inhabitants of the ocean. Even in their present disjointed and petrified state, they excite the admiration not only of the naturalist but of the common gazer; and the name of Stone-lily popularly applied to them, indicates a popular appreciation of their beauty. To the philosopher they have long been subjects of contemplation as well as of admiration. In him they raise up a vision of an early world, a world the potentates of which were not men but animals—of seas on whose tranquil surfaces myriads of convoluted Nautili sported, and in whose depths millions of Lily-stars waved wilfully on their slender stems. Now the Lily-stars and the Nautili are almost gone: a few lovely stragglers of those once-abounding tribes remain to evidence the wondrous forms and structures of their comrades. Other beings, not less wonderful, and scarcely less graceful, have replaced them; while the seas in which they flourished have become lands, whereon man in his columned cathedrals and mazy palaces emulates the beauty and symmetry of their fluted stems and chambered shells."

The species figured is the *Comatula rosacea*, or Rosy Feather-Star, "a creature which in its youth is fixed and pedunculate, like a zoophyte, in its adult state free and star-like." This view was first maintained by Mr. J. V. Thompson of Cork, who regarded the *Pentacrinus Europæus* as the young state of the *Comatula*, an opinion which has now been fully confirmed.

"When dredging," says Mr. Forbes, "in Dublin Bay in August 1840, with my friends Mr. R. Ball and W. Thompson, we found numbers of the *Phytocrinus* or Polype state of the Feather-star, more advanced than they had ever been seen before, so advanced that we saw the creature drop from its stem and swim about a true *Comatula*; nor could we find any difference between it and the perfect animal, when examining it under the microscope."

The Starfishes composing the second order are the OPHIURIDÆ, "so named from the long serpent or worm-like arms, which are appended to their round, depressed, urchin-like bodies;" they are divided into three genera and thirteen species; of these, two (*O. punctata* and *O. Goodsirii*) are for the first time described and figured. The *O. Ballii*, described a short time before in the 'Annals,' is now for the first time figured. A figure and description of *O. filiformis*, as a British species, appears for the first time, as does also a figure of the *O. brachiata* of Montagu. In speaking of the *O. filiformis*, the author describes a remarkable peculiarity in the structure of its spines, exhibiting "a very beautiful example of the adaptation of organization to the locality in which the creature is destined to live." And in the *O. bellis*, "one of the prettiest of its tribe," it is remarked,—

"This intermingled surface of spines and plates gives the disk that likeness to a daisy-flower, whence it has been called 'bellis' by some; nor is the flower at all degraded by the comparison, for but few daisies can show such beauty either of form or colour as is presented by this little Sea-star."

Persons who have not given attention to these objects, or who know them only in the dried and rigid aspect which they present in our museums, have no idea of the variety and beauty which they exhibit in the living state. Those who have ever been present when a dredge half-filled with the commonest of our Brittle-stars, *O. rosula*,

has been emptied, will bear testimony to the fidelity of the following description :—

“Of all our native Brittle-stars this is the most common and the most variable. It is also one of the handsomest, presenting every variety of variation, and the most splendid displays of vivid hues arranged in beautiful patterns. Not often do we find two specimens coloured alike. It varies also in the length of the ray-spines, the spinousness of the disk, and the relative proportions of rays and disk; and in some places it grows to a much greater size than in others. It is the most brittle of all Brittle-stars, separating itself into pieces with wonderful quickness and ease. Touch it, and it flings away an arm; hold it, and in a moment not an arm remains attached to the body.”

The notice of this species is most appropriately concluded by a vignette representing a portion of one of its spines, which, as it is justly observed, exhibits “a structure, the lightness and beauty of which might serve as a model for the spire of a cathedral.”

We next come to the *ASTERIADÆ*, or true Starfishes, an order whose beauty and symmetry seems to have “attracted the attention of such observers of nature as dwelt by the sea-side, from a very early period.”

“A fanciful analogy between the form of these Radiata and the popular notion of a star, has originated a name applied to them in most maritime countries,—a name which has given rise to a fine thought or two. ‘As there are stars in the sky, so are there stars in the sea,’ is Linck’s first sentence. ‘Cœlorum spectare sidera decet juvatque Astronomos: Physicorum interest stellis marinis visum intendere,’ saith Christian Gabriel Fischer in his preface to Linck’s volume. Our own poet, James Montgomery, whose inspiration has revelled gloriously among the wonders of Nature, beautifully expresses the same analogy,

‘The heavens
Were throng’d with constellations, and the seas
Strown with their images.’”

The order *Asteriadae* contains fourteen British species, distributed into eight genera, two of which, *Solaster* and *Luidia*, are established by our author. The *Cribella rosea* comes forward for the first time as a British species; *Uraster glacialis* is figured for the first time from a British specimen, and *Goniaster Templetoni* appeared previously only in Mr. Forbes’s paper in the ‘Wernerian Memoirs.’ The following important observation occurs in p. 82:—

“It is a remarkable fact, one which I have elsewhere pressed on the attention of geologists when considering the Mollusca, that whenever, as in the Hebrides, the tides fall but a few feet, these animals, usually inhabitants of deep water, may be found living above low-water mark. This holds good as well in regard to Radiata as to Mollusca; and the mixture of species generally considered inhabitants of the depths of the sea, with truly littoral species, should a fossil bed be formed, might lead to false conclusions unless such fact be borne in mind. Thus a change in the tides of a line of coast would materially affect its fauna.”

“The Solasters,” we are told, “are suns in the systems of Sea-stars. Their many rays and brilliant hues give them a distinguished place among the marine constellations.” The structure of the eyelid is described in p. 113; it forms a very perfect protection to the

eye, and is extremely difficult to be forced open against the will of the animal.

The fourth order, that of the ECHINIDÆ or Sea-Urchins, is thus introduced to our notice :—

“Of equal importance to zoologist and geologist is the study of the Sea-Urchins: to the former they present the perfection of radiism, as well as the first steps towards a symmetrical or bilateral form; to the latter the knowledge of their habits and organization is necessary in order to understand the relations and associations of the numerous species which abound in many of the earth's strata. Of all the Radiata they are most perfectly preserved in a fossil state. Their hard calcareous integument, or *shell*, as it is popularly but inaccurately termed, the parts of which are jointed together with wondrous completeness, is especially durable; consequently we find the hard parts of the extinct species frequently as perfect as those of the recent examples preserved in our cabinets.

“The Sea-Urchins are distinguished from all the other Echinoderms by their form, which is more or less rounded, without arms of any kind, and by their integument, in which calcareous matter is deposited so as to form series of regular plates, which plates are studded with tubercles, bearing jointed on them spines of various forms and sizes according to the genus or family.”

“The *Echinidæ* progress by means of the joint action of their suckers and spines, using the former in the manner of the *Asteriadæ*, and the latter as the *Ophiuridæ* do. Many Sea-Urchins, such as live on hard surfaces, moor themselves also by means of the suckers, and thus adhere very firmly to the rocks. That such is the mode of progression and rest among this family I assert, not only from the general belief of naturalists, but also from personal observation.”

On this point we can fully corroborate what the author has advanced, having repeatedly seen the common Urchin (*Echinus sphaera*) moving about or anchoring at pleasure by means of its suckers. The first time we noticed the fact was under circumstances which we still very vividly remember. We had cut horizontally into two nearly equal parts a large Sea-Urchin, for the purpose of examining the intestine and ovaries. These being removed, the shell was thrown on the deck of the little vessel, as being no longer of any service. It chanced, however, that we afterwards picked up the parts and placed them in a shallow vessel of sea-water. To our surprise, the suckers were soon extended and the animal walked about apparently as unconcerned as if the loss of intestine and ovaries had been an everyday occurrence.

Of the order *Echinidæ* there are seven genera and twelve species. *Brissus lyrifer* is now for the first time described and figured, and we have also for the first time figures of the *E. Flemingii* and *lividus*. We have long been aware of the fact that the common *Echinus* of the Mediterranean was a species distinct from our own, though both had been included in the common appellation of *E. esculentus*. The distinction is now announced by Mr. Forbes, and he gives the following excellent characteristics for the family *Echinidæ* :—

“The essential specific characters depend on the arrangement of the tubercles which bear the spines, on the spines themselves, and on the number and arrangement of the pairs of pores in the avenues of suckers. These pre-

sent good marks of distinction throughout the genus *Echinus*. The spines are especially important, as from the examination of a single spine it is possible to pronounce on the species to which it belongs. To the geologist this is evidently of great consequence, as frequently he meets only with a few scattered spines. But when we leave the family *Echinidæ*, we leave this important character behind us. Among the Heart-Urchins the spines present one common family structure. A single plate, either ambulacral or interambulacral, will also, from the arrangement of the spiniferous tubercles which cover its surface, enable us to pronounce pretty certainly on the animal of which it formed a part. Thus, in this family of Echinodermata, from an apparently insignificant fragment we can construct, as it were, a species, even as the student of the Vertebrata, from a broken bone, can pronounce on the form and habits of the animal to which it belonged."

To those—if such there be—who wandering on the beach, and noticing a Sea-Urchin flung there by the retiring tide, view it merely as part of the rejectamenta of the ocean—a thing to be glanced at with contempt, and broken into fragments under the foot, we recommend the careful perusal of the following extract, and beg they will treasure up in their "heart of hearts" the reflection with which it concludes :—

"In a moderate-sized Urchin I reckoned sixty-two rows of pores in each of the ten avenues. Now, as there are three pairs of pores in each row, their number multiplied by six, and again by ten, would give the great number of 3720 pores; but as each sucker occupies a pair of pores, the number of suckers would be half that amount, or 1860. The structure in the Egg-Urchin is not less complicated in other parts. There are above 300 plates of one kind, and nearly as many of another, all dove-tailing together with the greatest nicety and regularity, bearing on their surfaces above 4000 spines, each spine perfect in itself, and of a complicated structure, and having a free movement on its socket. Truly the skill of the Great Architect of Nature is not less displayed in the construction of a Sea-Urchin than in the building-up of a world!"

Among the *Echinidæ* none are more attractive than the *E. lividus*, a species which at the time Mr. Forbes wrote was believed to be peculiar to Ireland among the British Isles, but which has recently been discovered on the west coast of Scotland by the Rev. D. Landsborough. It is remarkable for its singular habit of boring principally into limestone rocks, and living in the excavation thus formed. In treating of this species the author gives the following interesting particulars :—

"Mr. W. Thompson informs me it is gregarious, and was seen abundantly in rock pools at low water by himself and Mr. Ball when visiting the South Isles of Arran in 1834. It is always stationary, the hole in which it is found being cup-like, yet fitting so as not to impede the spines. Every one lived in a hole fitted to its own size, the little ones in little holes and the large ones in large holes; and their purple spines and regular forms presented a most beautiful appearance studding the bottoms of the gray limestone rocks' pools."

We now pass on to the HOLOTHURIADÆ, an order composed of animals much less known to naturalists in general than those of the preceding orders. "A Holothuria may be regarded in one light as a soft Sea-Urchin, in another as a radiated animal approximating to the

Annelides." Besides progressing by means of suckers, "the *Holothuriadæ* move as Annelides do, by the extension and contraction of their bodies." "On our shores they are rare and unattractive animals, not often seen even by the zoologist; but abroad they are very abundant, and are in some places used as food."

"It is this animal which the Malays of the Oriental Isles seek so diligently for the supply of the China market, where it obtains a good price when well-preserved. It is employed by the Chinese in the preparation of nutritious soups, in common with an esculent sea-weed, sharks' fins, edible birds'-nests, and other materials, affording much jelly. Jaeger says the intestines are extracted, the animal then boiled in sea-water, and dried in smoke."

The order *Holothuriadæ* contains six genera, two of which, *Psalinus* and *Ocnus* are constituted by our author. It contains altogether fifteen native species, six of which are now for the first time described and figured; these are *Psolinus brevis*, *Cucumaria communis*, *C. fusiformis*, *C. fucicola*, *Ocnus lacteus* and *Thyone Portlockii*. There are three others which had been recently described in the 'Annals,' and are now for the first time figured, viz. *C. Drummondii*, *C. Hyndmanni*, and *Ocnus brunneus*; we have also for the first time a figure of *Cuc. hyalina*.

"Doubtless there yet remain many undiscovered species of *Holothuriadæ* in the British seas. Of Starfishes we must not expect to find many more kinds, though *Goniaster miliaris*, and some few others which have been seen on the Norwegian shores, may be looked for. Of Sea-Urchins there are probably still fewer unnoticed; but of the Sea-Cucumbers many. Their comparatively unattractive aspect, the difficulty of preserving them (they must always be kept in spirits), their habitat in the sea, and the little attention that has hitherto been paid to them by native zoologists, all lead me to believe that many species have been passed over. We have as yet no representative of the typical *Holothuria* which have twenty tentacula in the British Fauna. Several of these, such as the *Holothuria elegans* and *Holothuria mollis*, inhabitants of the Scandinavian shores, will probably ere long prove to be natives of our own."

Lastly, we come to the sixth order, SIPUNCULIDÆ. "In their external appearance they are worms," but internally they afford evidence of belonging to the same great class "with the *Holothuriadæ*." In the *Sipunculidæ* there are five British genera and eight species; two of these, *Syrinx Harveii* and *Sipunculus Johnstonii*, are now for the first time described and figured. Of *Syrinx papillosus* we have for the first time a figure; it was described shortly before this work appeared. *Syrinx nudus*, *Sipunc. Bernhardus*, *Priapulius caudatus*, and *Echinus vulgaris*, are for the first time figured from British specimens; the last-mentioned had not before been announced as a native of our seas.

The description given of some of these animals is extremely curious; one (*Priapulius caudatus*) "is shaped like a dice-box;" another has a sheath for its tentacula, presenting the form of a marrow-spoon. When we find the likeness of our household appurtenances thus dwelling beneath the waters as living animals, it calls to our mind the well-known quotation, "Nothing of *them* but doth suffer

a sea change." Instead, however, of giving a brief notice of three or four species, we shall content ourselves by taking the following more copious extract, descriptive of the *Sipunculus Bernhardus* :—

"The species bury in sand, or in the crevices of rocks, or, as is the custom of the curious animal before us, adopt the shells of dead univalve testacea for a house and home, after the manner of the Hermit Crab. The *Sipunculus* would appear, however, to be of a less changeable disposition of mind and body than its crustacean analogue, and when once securely housed in a shell to make that its permanent habitation. Whether the egg is originally deposited in the future habitation of the animal by some wonderful instinct, or is only developed when lodged by the waters in such a locality, or whether the parent *Sipunculus* bequeathes the chosen lodging of its caudal termination to its eldest born, and so on from generation to generation, a veritable *entailed* property, we know not at present; but the inquiry is a most interesting one, and well worth the attention of the experimental zoologist. The *Sipunculus* is not, however, content with the habitation built for it by its molluscan predecessor; it exercises its own architectural ingenuity, and secures the entrance of its shell by a plaster-work of sand, leaving a round hole in the centre sufficiently large to admit of the protrusion of its trunk, which it sends out to a great length, and moves about in all directions with great facility."

Throughout the entire work, Mr. Forbes makes the most hearty acknowledgments, not only to those who have either by specimens or by communications assisted his present labours, but to those hardy pioneers in the paths of science who first "broke ground" in this department of inquiry. As an example, we select the following tribute to Col. Montagu :—

"It is not merely the copiousness of his descriptions which gives them their peculiar value, though their fulness is a great merit; nor merely their perspicuity, though that is a still greater merit; but it is their logical character, that instinctive perception of the essential attributes and relations of each species, which is the most important faculty a naturalist can possess. Too many of our older naturalists (and can we claim exemption from the fault yet?) described forms as if there could be no creatures existing with which those forms might be confounded: they wrote of the animals they were characterizing, as if the whole book of Nature was already in print. Montagu was a forward-looking philosopher; he spoke of every creature as if one exceeding like it, yet different from it, would be washed up by the waves the next tide. Consequently his descriptions are permanent; and when he had full opportunities of examining any marine animal, subsequent observers have but little to add to his words."

We may remark, that in Mr. Forbes's own definition of species, he has evinced in no trivial degree the mental characteristics which he has ascribed to Montagu, and that the specific characters are remarkable, not only for the judgment with which they are selected, but for the precision and perspicuity with which they are expressed.

Yet notwithstanding the pains-taking accuracy with which these definitions must have been elaborated, the book smells not of the lamp. The style throughout is peculiarly easy, varied, and unlaboured. As we turn over the pages, we find we are giving attention to animals, not dried in a cabinet, or preserved in alcohol, but putting forth in their native haunts, their several aspects, powers, and

peculiarities. Our thoughts turn to the sea. We hear in fancy the rippling of the tide, or the swelling of the surge, and feel upon our cheek its fresh and invigorating gales. We accompany the author in his researches on the coasts of Great Britain and Ireland, and venture with him even into the Shetland seas, where "the king of the sea-cucumbers" holds his court. In by-gone times we remember learning from a fragment of some old ballad,

"The herring loves the merry moonlight,
The mackerel loves the wind,
But the oyster loves the dredging song,
For they come of a gentle kind."

Mr. Forbes does not tell us if any of the creatures which he has taken under his patronage partake of the penchant for the dredging song, which is here attributed to the oyster. We would rather surmise, that all which have escaped his pen and pencil are evincing their determination not to permit any prying naturalist "to draw their frailties from their dread abode," for we believe that the researches of succeeding naturalists have not as yet added even one species of Echinodermata to those which Mr. Forbes has recorded.

In other departments of zoology, traditionary lore and superstitious feelings have made certain animals be regarded with some degree of reverence, or avoided with some infusion of awe. It is curious to find, that even to the Radiate animals, though so low in the scale of being, something of the same kind of superstitious dread has been extended. Thus we are told,—

"The Common Brittle-star often congregates in great numbers on the edges of scallop-banks, and I have seen a large dredge come up completely filled with them; a most curious sight, for when the dredge was emptied, these little creatures, writhing with the strangest contortions, crept about in all directions, often flinging their arms in broken pieces around them, and their snake-like and threatening attitudes were by no means relished by the boatmen, who anxiously asked permission to shovel them overboard, superstitiously remarking that 'the things weren't altogether right.'"

The great Sea-Cucumber, we are told, is by the Shetland fishermen arranged

"in an extensive though most unphilosophically constituted class of marine animals, to which they apply the term 'Pushen,' which being translated signifies poison. In this Thulean arrangement numbers of the rarest of British animals are unfortunately included,—I say unfortunately, for all members of the class *Pushen* are unceremoniously and speedily thrust overboard almost as soon as seen in the fishing-boats, being considered unlucky and dangerous in their nature."

The author elsewhere says, in speaking of the common Cross-fish (*Uraster rubens*),—

"Dr. J. L. Drummond of Belfast favours me with the following note on their Irish denomination:—"The Starfishes are called at Bangor (county Down) the *Devil's fingers*, and the *Devil's hands*, and the children have a superstitious dread of touching them. When drying some in the little garden behind my lodgings, I heard some of them on the other side of the hedge put the following queries:—"What's the gentleman doing with the bad man's hand? Is he ganging to eat the bad man's hands, do ye think?""

We should be glad, did our space permit, to descant on the permanence of certain kinds of traditionary legends among the fishermen of our coasts. Mingling comparatively little with other classes of men, pursuing in companionship with each other their laborious and uncertain calling, they transmit to the succeeding generation the heritage of legendary superstition which they have acquired from the past. We lately noticed a plank covered with the barnacle shells (*Lepas anatifera*) in a living state, cast upon the shore, and upon asking what they were of a hoary fisherman who was expounding their nature to a circle of attentive listeners, we were told that they were the shells that gave birth to the barnacle goose, and with a gracious condescension fitted to our seeming ignorance, he offered to point out the bill and feathers of the future bird. We must own we take a great pleasure in listening to these old stories, and in viewing the simple and industrious race among whom they are current. To the humble but hardy companions of his dredging labours, Mr. Forbes has not been inattentive. While studying the marine productions which the dredge brought to light, he has not neglected the men, by whose exertions they were procured. And this habit we know has not been suffered to slumber during his recent visit to the Ægean, for we have seen a letter to a friend, in which he says, "The scenery in many of the islands was very picturesque, the people in all most interesting; and the inquisitive, speculative, and news-knowing spirit of the old Greek is the same now as in the days when it was caricatured by Aristophanes."

Our author would seem to be one of those who believe "it is good to be merry and wise," for mirth and wisdom seem at times to dispute the possession of his pages, or rather we should say to hold them as joint and friendly occupants. Matters of high interest in the history or œconomy of the animal are served up to us in so humorous a style, that there are pages in the 'History of British Starfishes' which we would be half inclined to prescribe as "a cure for the heart-ache." Thus, under the head of *Ophiocoma punctata* we have the following paragraph:—

"The stomachs of fishes are often zoological treasuries. The Haddock is a great conchologist. In his travels through the country of the Mermaids, he picks up many curiosities in the shell way. Not a few rare species have been discovered by him; and the ungrateful zoologist too frequently describes novelties without an allusion to the original discoverer. As Haddocks are not in the habit of writing pamphlets or papers, the fraud remains undiscovered, greatly to the detriment of science: for, had the describer stated to whom he was indebted for his specimen, we could form some idea of its habitat and history, whether littoral or deep sea,—very important points in the œconomy of Mollusca,—important not only to the malacologist, but also to the geologist. Like the Haddock, the Cod also is a great naturalist; and he, too, carries his devotion to our dear science so far as occasionally to die for its sake with a new species in his stomach, probably with a view to its being described and figured by some competent authority. The Cod is not so much devoted to the Mollusca as to the Echinodermata; and doubtless his knowledge of the *Ophiuræ* exceeds that of any biped. He has a great taste for that tribe. It was a Cod that communicated the pretty little species I am about to describe, to my friend Mr. Henry Goodsir, at Anstru-

ther; and, as far as that gentleman could learn, it would appear the industrious animal had observed and entrapped this new *Ophiocoma* in the North Sea near the Dogger Bank.

And as a worthy companion to this picture, we present one of the *Luidia fragilissima* :—

“It is the wonderful power which the *Luidia* possesses, not merely of casting away its arms entire, but of breaking them voluntarily into little pieces with great rapidity, which approximates it to the *Ophiuræ*. This faculty renders the preservation of a perfect specimen a very difficult matter. The first time I ever took one of these creatures I succeeded in getting it into the boat entire. Never having seen one before, and quite unconscious of its suicidal powers, I spread it out on a rowing bench, the better to admire its form and colours. On attempting to remove it for preservation, to my horror and disappointment I found only an assemblage of rejected members. My conservative endeavours were all neutralized by its destructive exertions, and it is now badly represented in my cabinet by an armless disk and a diskless arm. Next time I went to dredge on the same spot, determined not to be cheated out of a specimen in such a way a second time, I brought with me a bucket of cold fresh water, to which article Starfishes have a great antipathy. As I expected, a *Luidia* came up in the dredge, a most gorgeous specimen. As it does not generally break up before it is raised above the surface of the sea, cautiously and anxiously I sunk my bucket to a level with the dredge's mouth, and proceeded in the most gentle manner to introduce *Luidia* to the purer element. Whether the cold air was too much for him, or the sight of the bucket too terrific, I know not, but in a moment he proceeded to dissolve his corporation, and at every mesh of the dredge his fragments were seen escaping. In despair I grasped at the largest, and brought up the extremity of an arm with its terminating eye, the spinous eyelid of which opened and closed with something exceedingly like a wink of derision.”

The following extract is of a different character, and needs not our introduction. Its philosophic spirit will commend itself to our readers :—

“The tracing of the connections between species and species, through minute differences combined with general resemblances, is one of the greatest pleasures which enliven the studies of the naturalist. Every here and there in organized nature we find creatures presenting the forms of one species, and the structure of another, filling up a supposed blank, or overturning a supposed barrier. The discovery of such forms frequently annihilates genera which we had long considered fixed, or brings together species which we had long looked upon as but doubtfully related to each other. There are men who affect to look down on the investigator of ‘mere species,’ who, with patronizing self-sufficiency, talk of the ‘humble observers of minute differences of forms,’ and who scarcely rank the recorder of new animals or plants above the mere collector or virtuoso. Yet such persons affect perfectly to understand the great laws of nature; and will write on what they are pleased to term the philosophy of natural history, often without the knowledge of a single form or structure save from a picture in a book. The humility which the knowledge of the abundance of undiscovered things teaches the practical naturalist, prevents him retorting on such would-be philosophers; and knowing how little we yet know, he scarcely ventures to pronounce any law general. He knows too well that the conclusion he drew in the morning is often overturned by the discovery he makes in the evening, to pronounce himself the lawgiver of nature; yet also knowing, from

the perfection of all he sees around him, that the machinery of nature is perfect, and hoping the laws of that machinery discoverable, he points out the indications of those laws wherever he perceives a glimpse of their influence, and works as trustfully towards the development of the truth."

And although our quotations have extended to great length, we cannot withstand the gratification of giving to our readers the concluding paragraph. It breathes a spirit which the pious and philosophic naturalist will ever appreciate :—

" Among the British Echinodermata we have seen some of the most extraordinary forms in the animal kingdom, some of the most wonderful structures and of the strangest habits. Much yet remains to be done towards their elucidation, and the investigation of them both structurally and formally presents a wide field of inquiry to the student of Nature, as yet but imperfectly explored. The great naturalist of Denmark, Müller, long ago said that we need not resort to distant regions and foreign climes for rare or wonderful creatures; that the fields, the woods, the streams, and the seas of our native lands abounded in wondrous evidences of God's power and wisdom. The investigation of our native animals must ever be a chief source of sound zoological knowledge, for it is there only we can watch, under favourable circumstances, for the observation of their development, their habits, and their characters. The naturalist whose acquaintance is confined to preserved specimens in a cabinet, can form but a vague idea of the glorious variety of Nature, of the wisdom displayed in the building up of the atoms of matter to be the houses of life and intellect. And unless we study the creatures living around us, how can we gain that delightful knowledge? The passing note of an animal observed during travel is an addition to science not to be scorned; the briefly characterizing of a new species from a preserved specimen, if done with judgement, is of importance; but the real progress of natural history must ever depend on the detailed examination of the beings gathered around us by the laws of geographical distribution, living and multiplying in their destined homes and habitats."

Our extracts have extended to such a length, that we are unable to notice as they deserve the numerous wood-cuts with which the work is illustrated and embellished. They may be divided into three classes. First, the representation of each of the sixty-three species described in the work, with magnified drawings of such parts as serve to convey a better idea of the specific distinctions or peculiarities of structure. The author says in the introduction, " with three exceptions the figures of species are from my own drawings, and with a view to secure correctness were mostly drawn on the wood by myself."

" The wood-cutting," he remarks, " speaks for itself,—thanks to Mr. Bastin, who in the most praiseworthy manner made himself acquainted not merely with the drawings, but with the texture and appearance of the animals themselves, in order the better to express them."

Next in order we may mention those which may be regarded as embellishments, including under this title the poetical or allegorical designs which appear at the commencement of the several orders, and those which are technically known as " tail-pieces." Some of the latter are replete with humour, and will be sure to find favour with every admirer of Bewick. The third division of the illustrations is of a kind peculiar to the present work, and well fitted to increase the

interest with which it is read. They consist of a series of views of many of the localities in these kingdoms where researches among the Echinodermata have been conducted. Thus we have from the Isle of Man, Breda Head, the ruins of Peel Castle, and those of St. Germain's Cathedral. On the English coast we have Scarborough and Tyne-mouth. On the Irish, Belfast Bay. On the Scotch, St. Andrew's Castle, the Kyles of Bute, &c. These vignettes in general represent scenery which is in itself picturesque; some of them are perfect gems—as for example, that of the Frith of Forth, with the Bass Rock and North Berwick Law, and that of Holy Loch, in the Clyde district, during a squall,—all are deserving of commendation, and furnish exquisite examples of the perfection which the art of wood-engraving has now attained. The woodcuts alone are worth, at a very moderate computation, more than the publication price of the entire volume.

A General History of Animalcules. By A. Pritchard. Part I. London, Whittaker.

We have already had occasion to notice this work in a former Number of this Journal, and we have now much pleasure in informing our readers that Mr. Pritchard has thought it expedient to publish the plates of this work, containing upwards of 3500 beautiful figures illustrative of each genus of Infusoria, described by Ehrenberg in his large work in a separate form. In no branch of natural history are drawings of the subjects more requisite, and there is no doubt, from microscopes being now in the hands of almost all lovers of natural history, and Infusoria being generally the first things which attract the attention of the observer, that this work will meet with great approbation, especially as it leaves nothing to be desired with respect to price, the cost of each plate, containing upwards of fifty subjects, not amounting to sixpence. The whole is accompanied by a general history of Animalcules, with their localities, best mode of capture, and method of examining them under the microscope, &c.

Books received.

The Naturalist's Library:—Ornithology, vol. xiii. The *Nectarinidæ*, or Sun Birds. By Sir W. Jardine.

Thirty-six volumes of the Naturalist's Library are now published, viz. :—

Of Ornithology, 13 vols.

Of Ichthyology, 3 vols.

Of Entomology (complete), 7 vols.

Of Mammalia (complete), 13 vols.

There will be forty volumes in all. The remaining four will include British Fishes in 2 vols., and the concluding portions of British Birds and the Fishes of Guiana. These are confidently expected by Midsummer.

History of British Birds. By William Yarrell, F.L.S., &c. Part 34. Dec. 1842. 8vo. Van Voorst.

This Part commences the *Laridæ*, and completes the descriptions

of the Terns, of which ten species are introduced belonging to our native list. The most interesting species to the British ornithologist is the *Sterna Leucopreia*, for species of which, killed in the end of August at Lyme on the Dorsetshire coast, Mr. Yarrell is indebted to T. C. Heythem, Esq. of Carlisle.

Transactions of the Royal Society of Edinburgh. Vol. xv. Part 2.
Session 1841-42, Dec. 1842. 4to. Grant and Son.

An unusually thin number, containing only sixty-nine pages; but we have among the contents two papers relating to zoology and botany, both of them illustrated with plates, of the first we have given an abstract at page 126 of the present Number. The second paper alluded to, is on the ultimate secreting structure, and on the laws of its function, by John Goodsir. The conclusions arrived at by the author are: "That all the true secretions are formed by a vital action of the nucleolated cell, and that they are first contained in the cavity of that cell; that growth and secretion are identical,—the same vital process under different circumstances.

Preparing for Publication.

Supplement to Dr. Parnell's Grasses of Scotland, including the Cereal Grain, making the British Grasses complete.

We have much satisfaction in learning that the results of Captain Belcher's Voyage in H.M.S. Sulphur are to be made available to science in the most advantageous manner, Government having advanced a sum of money to provide the requisite illustrations. Richard Brinsley Hinds, Esq. has been appointed by the Admiralty to edit and superintend the publication, and the co-operation of Mr. J. E. Gray, Dr. Richardson, Mr. Gould, &c., has been obtained by that gentleman, to describe respectively the mammalia, fish, birds, &c., the shells being undertaken by himself.

The work is to be published in parts, and at a moderate price.

Part XI. of Taylor's Scientific Memoirs, just published, contains Ehrenberg's important memoir on the Animals of the Chalk Formation.

PROCEEDINGS OF LEARNED SOCIETIES.

ZOOLOGICAL SOCIETY.

Feb. 8, 1842.—William Yarrell, Esq., Vice-President, in the Chair.

Some notes on the habits of the Horned Screamer (*Palamedea cornuta*, Linn.), by William Martin, Esq., Secretary to the Clifton Zoological Gardens, were read.

These notes were communicated by the President, the Earl of Derby, and are drawn up from observations made upon a specimen of the *Palamedea* living in the Clifton menagerie.

"The Horned Screamer was presented to the Society early in June 1839, by Capt. Rees of Bristol. On its arrival in this country it was exceedingly thin and weak. It had been fed during the voy-